Frances Hamerstrom Wildlife Biologist

By Catherine E. Matthews and Helen Cook

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Two objectives of elementary school science education are to introduce students to the history of science and to contemporary science and scientists. Many educators realize that to encourage children's interests in science, nurture their positive attitudes toward science, and facilitate their understanding of science concepts, they must make scientists and scientists' work easily accessible. Yet, authentic science that is easily understandable and in-depth knowledge of the people who do science are often beyond the scope of the elementary school science curriculum. Also, there is little material available on scientists—especially women scientists—that students find appealing. The following information and activities for the elementary school science classroom should help somewhat to alleviate that gap.

The main purpose of this article is to provide a series of science lessons for grades K-5 geared around the work and life of wildlife biologist Frances Hamerstrom (1907-1998), thus imprinting on students and teachers one naturalist,s amazing life and giving them a perspective of how far the study of ecology and preservation has come in this century. The following activities are grouped around specific books that Hamerstrom wrote.

The activities described in this article are consistent with the *National Science Education Standards* (National Research Council, 1996), which in the K-4 content standards, suggest that students develop an understanding of organisms, their life cycles, and their relationships with their environments. By reading about the work of Frances Hamerstrom, students will learn more about birds of prey, such as owls. Students will also learn about

Selected Books by Frances Hamerstrom

Hamerstrom, F. (1970). *An Eagle to the Sky.* Ames, IA: Iowa State University Press.

Hamerstrom, F. (1972). *Birds of Prey of Wisconsin.* Madison, WI: Department of Natural Resources.

Hamerstrom, F. (1975). *Walk When the Moon Is Full.* Trumansburg, NY: The Crossing Press.

Hamerstrom, F. (1977). *Adventure of the Stone Man.* New York: Lyons and Burford.

Hamerstrom, F. (1980). *Strictly for the Chickens.* Ames, IA: Iowa State University Press.

Hamerstrom, F. (1984). *Birding with a Purpose: Of Raptors, Gabboons, and Other Creatures.* Ames, IA: Iowa State University Press.

Hamerstrom, F. (1986). *Harrier, Hawk of the Marshes.* Washington, DC: Smithsonian Institution Press.

Hamerstrom, F. (1989). *Is She Coming Too? Memoirs of a Lady Hunter.* Ames, IA: Iowa State University Press.

Hamerstrom, F. (1989). *The Wild Food Cookbook.* Amherst, WI: Amherst Press.

Hamerstrom, F. (1994). *My Double Life.* Madison, WI: University of Wisconsin Press. [contains the full text of *Strictly for the Chickens*]

owls as predators and their prey—especially when examining owl pellets. Furthermore, students will, as another K-4 content standard suggests, understand that science is a human endeavor based on their studies of Frances Hamerstrom and her contributions to wildlife biology.

The Life of Frances Hamerstrom

A legend in the fields of ornithology and natural science, Hamerstrom led a most interesting life. Born to wealth and reared to be an international hostess, Frances Hamerstrom left this designated lifestyle to travel as an unpaid (at times) naturalist and work with her husband, Frederick Hamerstrom.

Both of the Hamerstroms studied with Aldo Leopold, the father of wildlife biology at the University of Wisconsin. In the 1930s, Hamerstrom and her husband were largely responsible for saving the Wisconsin prairie chicken from extirpation (extinction from a local or regional area) by protesting the draining of Wisconsin wetlands.

Hamerstrom was also the first falconer in the United States, the first woman wildlife biologist in the world, and internationally recognized for her work with raptors (hawks, eagles, and owls). Even at 90 years old, Hamerstrom was an active writer and wildlife biologist. Over the years, she wrote over 100 articles including scientific publications, children's books, and books for the hobbyist bird watcher as well as the professional ornithologist. Hamerstrom's children's books make excellent "read-alouds" and lend themselves well to classroom activities (see sidebar). The following are examples of activities we have used in the classroom that are centered around one or more of Hamerstrom's writings.

Adventure of the Stone Man

Set in France, Adventure of the Stone Man (Hamerstrom, 1977) details the adventures of two young children who discover a secret place that is the habitat for an endangered eagle owl. The secret hideaway contains fossil owl pellets, among which the children discover a stone figure, the stone man. The young girl, Marie, unravels the story of how the stone man came to reside in an owl pellet. The carving was dropped among gravel, a cock-of-the-woods (a bird) ingested the gravel, an eagle owl ate the cock-ofthe-woods, and then the eagle owl coughed up an owl pellet containing the stone man.

Adventure of the Stone Man is a short book with 103 pages divided into 24 chapters. I buy one copy of the book, cut it up, and put the pages in page protectors; this procedure works well for this book because it is fiction. For this activity, I give each student a chapter or two and allow them sufficient time to read the chapter and briefly summarize important points using the simplified who, what, when, where, and why guidelines.

After reading silently and digesting the chapter(s) they have received, students outline, concept map, paraphrase, or otherwise condense their material into a 30- to 60-second oral presentation. Then, the story is told by the class.

The following questions are provided as guidelines to the students before they begin their silent reading. The first two questions (what and who) are answered before they begin to read, and then they look for answers to the remaining questions as they read.

1. What is the title of the story?
2. Who is the author of the story?
3. The main characters in the story are two children. What are their names?
4. Where does the story take place?
5. What do the children discover?
6. What is the scientist looking for?
7. How do the children help the scientist?
8. What did you learn from this story?

9. What questions do you have about this story?

A corollary activity that we often complete either before or after the reading selection is the dissection of owl pellets and a study of their contents. Excellent articles on owls and owl pellet dissections have appeared in previous issues of Science and Children (see Also in S&C). Also, science supply companies sell owl pellet dissection activity with a class of students.

Strictly for the Chickens

A local field study of grasshopper populations can be easily related to material in Hamerstrom's autobiography, Strictly for the Chickens (1980). For Hamerstrom, telling individual prairie chickens apart was easy, but telling elementary school children apart was difficult. There are several excellent pages of description in her autobiography about naming prairie chickens. Doing a capture/recapture study with grasshoppers on school grounds lets students develop the understanding behind the science of knowing their subjects.

On day one, students

capture grasshoppers with aerial nets, develop a marking scheme with small dots of white correction fluid, record their marks, and release the grasshoppers. On day two, students again sample the population and record the previously captured and marked grasshoppers. In this way, students can easily understand the importance of being able to identify individuals in a population and can more easily relate to the studies that Hamerstrom conducted. I have also done this activity with water striders to determine their range. Some of my fifth-grade students have enjoyed the entire book as a free-choice reading selection.

Walk When the Moon Is Full

The small book Walk When the Moon Is Full (1975) details the explorations of Hamerstrom and her own two children each night of the full moon for a full year. From owls to deer to woodcocks to weasels, this family finds a new discovery on each trip out during the night of the 13 annual full moons. I send chapters home to parents and ask families to conduct full moon walks. Students write about their own experiences on the walks, share these experiences with their classmates, and assemble the descriptions of these experiences into a class book.

A Selection of Writings

This activity is conducted by handing out a series of passages from several of Hamerstrom's books or reading these aloud. allowing students to discover the writer and her work one passage at a time. Again, students are simply asked to read and attempt to identify the five W's for the selections. The selections are all short (one to four pages). I use the selections as sequenced and described below:

- Walk When the Moon Is Full (1975), pages 23-25, describes an April full moon adventure of locating peenting woodcocks (male birds of this species have a special and impressive flight pattern during their breeding season).
- Birding with a Purpose (1984), pages 16-19, describes a group of wildlife biologists trapping and banding a diurnal hawk owl.
- An Eagle to the Sky (1970), pages 3-5, includes a description of the first nesting attempts of Hamerstrom's captive golden eagle.
- Birds of Prey of Wisconsin (1972), pages 2831, includes brief descriptions of birds of prey that reside in or visit the state of Wisconsin, including the kestrel, osprey, and harrier hawk.
- Adventure of the Stone Man (1977), pages 20-21, describes and illustrates the discovery of the stone man.
- Strictly for the Chickens (1980), page 55, describes the naming of prairie chickens.
- Strictly for the Chickens, pages 172-173, describes the conservation efforts of the Hamerstroms and the issue of saving an individual vs. saving a species.

Role-Playing

Another very successful activity for introducing students to a number of scientists involves students role-playing a particular scientist. Students choose a scientist they are interested in (e.g., a scientist who was born on their birthday or birth month, a scientist from a country they are studying in social studies, etc.). (See Resources for information on women scientists.) Students conduct research to gather basic biographical information such as birth and death dates, notable publications, areas of research, education and training, and other interesting facts. Students then present this information "in character" as their scientist.

For example, when one of the authors appeared at a local university event as Hamerstrom, she wore field boots and a hat and had her kestrel (a small "sparrow" hawk) trap with her. She introduced herself as Frances Hamerstrom and shared some of her notable finds regarding birds of prey. Students do this quite successfully, and last year, we had four fifth-grade students (Galileo, Marie Curie, Jane Goodall, and Sylvia Earle) who accompanied preservice teachers (who had also assumed the roles of many scientists) to our state science teachers convention (Matthews, Hildreth, and Cook, unpublished manuscript).

In addition to the role-play ideas, business cards make a nice addition to these presentations. With many business card software programs now widely available, this is an easy activity to do. Students can select an appropriate graphic, choose pertinent biographical information to include, and print several sheets of cards to hand out as they speak. (We have used The Print Shop Deluxe CD Ensemble program by Broderbund ($49.95; Print Shop Standard, $29.95).)

Scientist Lab Coat Project

As a way to introduce General Greene Elementary School's students to notable scientists, we had several lab coats autographed by various groups of scientists. For example, one lab coat bears the signatures of scientists at the University of North Carolina at Greensboro. We visited briefly with each scientist and requested the scientists' signatures.

Another lab coat features women biologists with whom we have personally visited. Yet another lab coat will feature 10 wildlife biologists. We also plan to send lab coats around the United States and to other countries for signatures of other scientists.

Hamerstrom's autograph is the first of the scientists' signatures to appear on the appropriate lab coats. Hamerstrom signed 10 lab coats in July 1998 when we visited her at home in Plainfield, Wisconsin.

A series of lessons will be conducted using these lab coats as visual aids, attention grabbers, and sources of information. The project may be extended with funding to allow each child to design his or her own lab coat to reinforce the idea that children are scientists and must be able to see themselves as using science in their everyday lives in order to develop a true appreciation for the field.

Scientists Come Alive

These activities make the lives of Frances Hamerstrom and other scientists come alive for students and teachers. The learning benefits are both immediate and long lasting. Students and teachers begin to understand what scientists do and how very interesting a life in science may be!

Resources

Matthews, C., Hildreth, D., and Cook, H. (1998). Scientists alive! Unpublished manuscript.
National Research Council. (1996). National Science Education Standards. Washington, DC: National Academy Press.

Information on Women Scientists

Barba, R.H. (1998). Science in the Multicultural Classroom. Boston, MA: Allyn and Bacon.
Biographical Sources in Science, Technology, and Medicine http://www.asap.unimelb.edu.au/hstm/hstm_biographical.htm

Marine Biological Laboratory in Woods Hole, Massachusetts— Women who studied at the MBL in its earliest days
http://www.mbl.edu/html/WOMEN/ women.html

Also in S&C

Daisey, P., and Dabney, J. (1997). Learning from others. Science and Children, 34(6), 40-42.
Edwards, L., and Nabors, M. (1992). The whos and whats of owl behavior. Science and Children, 29(6), 38-40.
Yee, G.C. (1969). The owl pellet. Science and Children, 6(8), 9-11.
Zipko, S. (1983). Connect them bones! An interdisciplinary study of owl pellets. Science and Children, 20(6), 12-15.

Web Connections

For more information about Frances Hamerstrom, prairie chickens, and additional curriculum ideas, try the following Web sites:
http://www.uwsp.edu/acad/cnr/wi ldlife/programs/Pchicken/Pcindex.htm http://www.highlands.w-cook.k12.il.us/prairie/prairiel.html
http://strafford.k12.mo.us/Wildthings%20Finished/Myers/Prairie Chicken.html

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